

# Guidelines For Estimating Irrigated Processing Potato Costs

## Production Costs based on 399 acres

Date: March, 2007

Potato acreage in Manitoba has increased significantly in the last 10 years. Expansion in the French Fry processing industry has been the main driver of this increase. This expansion has placed Manitoba second only to Prince Edward Island in total area planted to potatoes. Processing acreage in Manitoba accounts for over 80% of the total acreage and results in an annual value-added in excess of \$360,000,000. The balance of the acreage is divided between seed (10,500 acres) and fresh (table) production (8,000).

The following budget estimates the cost of producing processing potatoes based on a total land base of 480 acres, with certain input costs based on 420 acres and a harvested acreage of 399 acres. This is due to the trend toward the dryland corners not being planted to potatoes, where pivot irrigation is used. The figures provide an economic evaluation of processing potatoes required to cover all costs including labour and investment. Management has not been accounted for in this enterprise budget.

To estimate a cash flow budget the actual payments on principal and interest may be substituted for the fixed costs in the budget. As well, an estimate has to be made to cover family living expenses and funds required for capital purchases.

**Disclaimer:** This budget is only a guide and is not intended as an in-depth study of the cost of production of this industry. Interpretation and utilization of this information is the responsibility of the user. If you require assistance with developing your individual budget, please contact your local Manitoba Agriculture, Food and Rural Initiatives office.

### Irrigated Processing Potato Cost of Production - March, 2007

	Potato Cost <u>/Acre</u>	Cost <u>/CWT</u>	Your Cost
<b>A. Operating Costs</b>			
1.01 Seed & cutting	\$203.00	\$0.84	_____
1.02 Seed treatment	\$52.32	\$0.22	_____
1.03 Fertilizer	\$140.16	\$0.58	_____
1.04 Herbicides	\$47.44	\$0.20	_____
1.05 Fungicide & Insecticide	\$174.74	\$0.72	_____
1.06 Fuel Costs-Field	\$77.37	\$0.32	_____
1.07 Trucking Costs	\$36.34	\$0.15	_____
1.08 Irrigation Fuel	\$39.70	\$0.16	_____
1.09 Maintenance & Repairs	\$186.72	\$0.77	_____
1.10 Custom Work & Rental	\$90.00	\$0.37	_____
1.11 Hired Labour	\$169.72	\$0.70	_____
1.12 Insurance	\$75.11	\$0.31	_____
1.13 Utilities	\$31.33	\$0.13	_____
1.14 Other Costs	<u>\$70.83</u>	<u>\$0.29</u>	_____
Subtotal Operating Costs	\$1,394.77	\$5.75	_____
1.15 Interest on Operating	<u>\$48.82</u>	<u>\$0.20</u>	_____
<b>Total Operating Costs</b>	<b>\$1,443.59</b>	<b>\$5.95</b>	_____
<b>B. Fixed Costs</b>			
2.01 Own Land Cost	\$100.00	\$0.41	_____
2.02 Depreciation	\$326.98	\$1.35	_____
2.03 Investment	<u>\$143.51</u>	<u>\$0.59</u>	_____
<b>Total Fixed Costs</b>	<b>\$570.49</b>	<b>\$2.35</b>	_____
<b>C. Labour</b>			
3.01 Own Labour	<b>\$98.00</b>	<b>\$0.40</b>	_____
<b>Total Cost of Production</b>	<b>\$2,112.08</b>	<b>\$8.70</b>	_____

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### Assumptions

1. This budget outlines the cost of producing processing potatoes under irrigated conditions and is based on a pivot system with a river as the water source. (see back page for details)
2. A potato land base of 399 harvested acres was assumed in developing this budget. The cost of production does not include the cost of maintaining the corners not under irrigation. The crop rotation was based on growing potatoes no more than 1 in 3 years
3. Total gross yield per acre was assumed at 285 cwt/acre with marketable yield estimated at 242.25 cwt/acre. Assumed contract size of 100,000 cwt.
4. Crop Insurance is based on premiums for 2005 at the 80% coverage rate.
5. All trucking operations related to marketing of processed potatoes were assumed to be custom hauled to the processors. A rate applicable to hauling potatoes approximately 100 miles was assumed.

### Irrigated Potato Cost of Production Worksheet

#### A. Operating Costs

#### Your Cost

##### 1.01 Seed & Cutting Cost (Russet Burbank)

Seed		14	cwt/acre	
	x	\$13.00	\$/cwt	
	=	\$182.00	\$/acre	
Cutting		14	cwt/acre	
	x	\$1.50	\$/cwt	
	=	\$21.00	\$/acre	
<b>Total</b>	<b>=</b>	<b>\$203.00</b>	<b>\$/acre harvested</b>	

##### 1.02 Treatment Cost

	\$1.50	\$/cwt fungicide	
+	\$2.05	\$/cwt insecticide	
x	14	cwt/acre	
=	\$49.70	\$/acre seeded	
x	420	acres seeded	
÷	399	acres harvested	
=	\$52.32	\$/acre harvested	

**1.03 Fertilizer**

Nitrogen		120	lbs/acre	
	x	<u>\$0.47</u>	<u>\$ / lb</u>	
	=	\$56.40	\$/acre	
Phosphate		90	lbs/acre	
	x	<u>\$0.30</u>	<u>\$ / lb</u>	
	=	\$27.00	\$/acre	
Potash		175	lbs/acre	
	x	<u>\$0.230</u>	<u>\$ / lb</u>	
	=	\$40.25	\$/acre	
Sulfur		25	lbs/acre	
	x	<u>\$0.20</u>	<u>\$ / lb</u>	
	=	\$5.00	\$/acre	
Micro	=	\$4.50	\$/acre	
Total	=	<b>\$133.15</b>	<b>\$/acre</b>	
	x	<b>420</b>	<b>acres fertilized</b>	
	÷	<u><b>399</b></u>	<u><b>acres harvested</b></u>	
	=	<b>\$140.16</b>	<b>\$/acre harvested</b>	

**1.04 Herbicide**

Preplant		\$3.60	\$/acre	
Post emergent		<u>\$41.47</u>	<u>\$/acre</u>	
Total		<b>\$45.07</b>	<b>\$/acre</b>	
	x	<b>420</b>	<b>acres sprayed</b>	
	÷	<u><b>399</b></u>	<u><b>acres harvested</b></u>	
	=	<b>\$47.44</b>	<b>\$/acre harvested</b>	

**1.05 Fungicide & Insecticide**

Contact Fungicide		11	number applications	
	x	1	kg/acre	
	x	<u>\$9.00</u>	<u>\$/kg</u>	
	=	\$99.00	\$/acre	
Systemic Fungicide		2	number applications	
	x	1	kg/acre	
	x	<u>\$22.50</u>	<u>\$/kg</u>	
	=	\$45.00	\$/acre	

Insecticide		2	number applications	
x		1	kg/acre	
x		<u>\$11.00</u>	<u>\$/kg</u>	
=		\$22.00	\$/acre	
<b>Total</b>	<b>=</b>	<b>\$166.00</b>	<b>\$/acre</b>	
	<b>x</b>	<b>420</b>	<b>acres sprayed</b>	
	<b>÷</b>	<b>399</b>	<b>acres harvested</b>	
	<b>=</b>	<b>\$174.74</b>	<b>\$/acre harvested</b>	

**1.06 Fuel Costs****a) Field Fuel Costs**

	<b>Capacity</b>	<b>TIME</b>	<b>FUEL</b>
	<u>ac./hr.</u>	<u>hr./ac.</u>	<u>\$/ac.</u>
Harrow	30.00	0.0333	\$0.92
Rotera	1.90	0.5263	\$17.46
Cultivate	18.50	0.0000	\$0.00
Plant	5.70	0.1754	\$4.85
Spray	36.50	0.0822	\$2.27
Cultivate	9.50	0.1053	\$2.91
Hilling	11.40	0.1754	\$4.85
Fertilize	30.00	0.0333	\$0.92
Harvest	2.40	0.4167	\$13.82
Tandem Disk	13.50	<u>0.0741</u>	<u>\$2.46</u>
Total		1.6221	\$50.46
	<b>acres worked</b>	<b>420</b>	
	<b>acres harvested</b>	<b>399</b>	
	<b>\$/acre harvested</b>	<b>\$53.12</b>	

**b) Truck Fuel Costs - from field to storage**

	285	gross yield (cwt)/ac.	
=	14.3	tons/ac.	
÷	12.5	truck capacity (tons)	
=	1.14	trips/acre	
x	<u>15</u>	<u>distance/trip (miles)</u>	
=	17.1	total miles/acre	
÷	2.5	fuel consumption (miles/gal)	
=	6.84	gallons required fuel	
x	<u>\$0.78</u>	<u>fuel cost (\$/litre)</u>	
<b>Field to Storage Costs</b>	<b>=</b>	<b>\$24.25</b>	<b>field to storage fuel cost</b>
<b>Field Costs</b>	<b>=</b>	<b>\$53.12</b>	<b>field costs</b>
<b>Total Fuel Costs</b>	<b>=</b>	<b>\$77.37</b>	<b>\$/acre harvested</b>

**1.07 Trucking Costs**

	242.25	net yield/acre	_____
x	<u>\$0.15</u>	net trucking rate/cwt	_____
=	<b>\$36.34</b>	<b>\$/acre harvested</b>	_____

**1.08 Irrigation Costs**

	72	hours for .75 inches	_____
=	96	hours for 1.0 inches	_____
x	5	inches water applied	_____
x	\$11.00	hourly pumping costs	_____
x	3	number of pivots	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$39.70</b>	<b>\$/acre harvested</b>	_____

**1.09 Maintenance & Repairs**

	\$35,000	machinery	_____
+	\$17,500	trucks	_____
+	\$7,000	potato storage	_____
+	\$5,000	other buildings	_____
+	<u>\$10,000</u>	<u>irrigation</u>	_____
=	\$74,500	total	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$186.72</b>	<b>\$/acre harvested</b>	_____

**1.10 Custom Work & Rental**

	\$0	desiccant	_____
+	\$0	sprout control	_____
+	\$33,810	spraying	_____
+	<u>\$2,100</u>	<u>fertilizer</u>	_____
=	\$35,910	total	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$90.00</b>	<b>\$/acre harvested</b>	_____

**1.11 Hired Labour Costs**

	\$2,520	field preparation	_____
+	\$4,200	seeding	_____
+	\$4,200	spray & cultivate	_____
+	\$35,798	harvest	_____
+	\$4,200	irrigation	_____
+	<u>\$16,800</u>	<u>storage</u>	_____
=	\$67,718	total cost	_____
÷	<u>399</u>	<u>acres</u>	_____
=	<b>\$169.72</b>	<b>\$/acre harvested</b>	_____

**1.12 Insurance**

	\$5,107	hail insurance	
+	\$14,871	crop insurance	
+	\$4,000	content insurance	
+	\$2,500	trucks	
+	<u>\$3,492</u>	<u>bldgs &amp; equip</u>	
=	\$29,970	total insurance	
÷	<u>399</u>	<u>acres</u>	
=	<b>\$75.11</b>	<b>\$/acre harvested</b>	

**1.13 Utilities**

	\$10,000	hydro	
+	\$0	heating fuels	
+	<u>\$2,500</u>	<u>telephone</u>	
=	\$12,500	total utilities	
÷	<u>399</u>	<u>acres</u>	
=	<b>\$31.33</b>	<b>\$/acre harvested</b>	

**1.14 Other Costs**

	\$6,500	accounting & legal	
+	\$2,000	membership	
+	\$11,760	crop consulting	
+	\$4,000	property taxes	
+	\$2,000	shop supplies	
+	<u>\$2,000</u>	<u>other costs</u>	
=	\$28,260	total miscellaneous	
÷	<u>399</u>	<u>acres</u>	
=	<b>\$70.83</b>	<b>\$/acre harvested</b>	

**1.15 Interest on Operating Costs**

(Operating interest is charged on one-half the sub-total operating costs)

	\$1,394.77	operating costs	
÷	2	average	
=	\$697.38	average value	
x	<u>7.0%</u>	<u>operating interest</u>	
=	<b>\$48.82</b>	<b>\$/acre harvested</b>	

**Capital Investment****Land Value**

Own land 480 ac. @ \$2000/ac	\$960,000	_____
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**Storage Facilities (120,000 cwt)**

Building & Climate Control (\$6.00/cwt)	\$870,000	_____
Equipment (bobcat, pilers, etc.)	\$120,000	_____
Workshop	\$40,000	_____
<b>Total Storage Costs</b>	<b>\$1,030,000</b>	_____

**Irrigation System**

River pump station	\$74,000	_____
Booster pump station	\$45,000	_____
Pipeline	\$220,000	_____
Pivots & generators	\$240,000	_____
<b>Total Irrigation Costs</b>	<b>\$579,000</b>	_____

**Machinery & Equipment**

Tractors (assumed 2 )	\$160,000	_____
Trucks	\$125,000	_____
Digger & Windrowers	\$95,000	_____
Planter	\$45,000	_____
Sprayer	\$35,000	_____
Tillage Equipment	\$50,000	_____
Miscellaneous	\$10,000	_____
<b>Total Machinery &amp; Equipment Costs</b>	<b>\$520,000</b>	_____

<b>Total Capital Investment</b>	<b>\$3,089,000</b>	_____
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**B. Fixed Costs****2.01 Land Costs**

	\$2,000	\$/acre	_____
x	5.0%	investment rate	_____
=	\$100.00	\$/acre harvested	_____



## 2.02 Depreciation

	<u>Original Value - Salvage Value</u>		
	<u>Useful life</u>		
Storage Facilities			
	\$1,030,000	original value	_____
-	\$51,500	salvage value	_____
÷	20	useful life (yrs.)	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$122.62	\$/acre harvested	_____
Machinery & Equipment			
	\$520,000	original value	_____
-	\$52,000	salvage value	_____
÷	10	useful life (yrs.)	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$117.29	\$/acre harvested	_____
Irrigation System			
	\$579,000	original value	_____
-	\$57,900	salvage value	_____
÷	15	useful life (yrs.)	_____
÷	<u>399</u>	<u>total acres</u>	_____
=	\$87.07	\$/acre harvested	_____
<b>Total =</b>	<b>\$326.98</b>	<b>\$/acre harvested</b>	_____

## 2.03 Investment Cost

$$\frac{\text{Original Value} + \text{Salvage Value} \times \text{Investment Rate}}{2}$$

2

## Storage Facilities

	\$1,030,000	original value	_____
+	\$51,500	salvage value	_____
+	2	average value	_____
x	5.0%	Investment rate	_____
+	<u>399</u>	<u>total acres</u>	_____
=	\$67.76	\$/acre harvested	_____

## Machinery &amp; Equipment

	\$520,000	original value	_____
+	\$52,000	salvage value	_____
+	2	average value	_____
x	5.0%	Investment rate	_____
+	<u>399</u>	<u>total acres</u>	_____
=	\$35.84	\$/acre harvested	_____

## Irrigation System

	\$579,000	original value	_____
+	\$57,900	salvage value	_____
+	2	average value	_____
x	5.0%	Investment rate	_____
+	<u>399</u>	<u>total acres</u>	_____
=	\$39.91	\$/acre harvested	_____

<b>Total =</b>	<b>\$143.51</b>	<b>\$/acre harvested</b>	_____
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**C. Own Labour Costs**

	7	hours/acre	_____
x	\$14.00	\$/hour	_____
=	\$98.00	\$/acre harvested	_____

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**For more information contact your local Manitoba Agriculture, Food and Rural Initiatives office**

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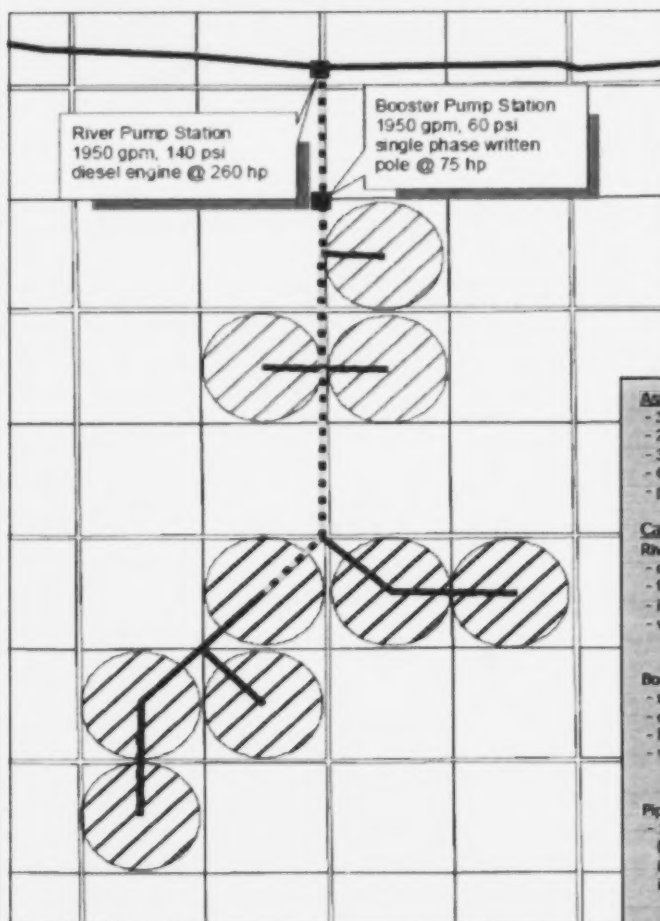
## Guidelines: Potato Production Costs



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### Example Irrigation System and Capital Costs



#### Legend

- Proposed Mainline Pipeline (15", 12" & 10")
- Proposed Lateral Pipeline (8")
- Proposed Pivots (3 total)
- Water
- Quarter Section Boundary
- River Pump Station
- Booster Pump Station

#### Assumptions

- 3 pivots @ 650 USgpm
- 275' elevation rise from river to booster
- 3.5" demand average year (330 hours pumping)
- 6.5" demand peak year (610 hours pumping)
- pivots require 35 psi at inlet

#### Capital Costs

<b>River Pump Station (260 hp)</b>	
- diesel motor & pump	\$36,000
- trailer & fuel tank	\$7,500
- intake & screen	\$19,000
- valving, piping, controls	\$11,500
	<u>\$74,000</u>

<b>Booster Pump Station (75 hp)</b>	
- single phase motor & pump	\$24,000
- electrical controls	\$10,000
- hydro	\$0
- valves, piping	\$11,000
	<u>\$45,000</u>

<b>Pipeline</b>	
- 15", 12", 10" & 8" PIP (S160 to S80)	
- including valves and installation	
	<u>\$220,000</u>

<b>Pivots &amp; Generators</b>	
- 3 pivots c/w diesel generators @ \$80,000 each	
	<u>\$240,000</u>
<b>Total Capital Cost</b>	<b>\$579,000</b>

<b>Annual Cost (power only)</b>	
3.5"	\$9,100
6.5"	\$16,000

Canada

PFRA<sup>1</sup> ARAP

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